Stoller
Hanford Office

DOE-EM/GJ841-2005

299-E13-57 (A5872)
Log Data Report

Borehole Information:

Borehole:	299-E13-57 (A5872)		Site:	216-B-27 Trench	
Coordinates (WA St Plane)		GWL[1] (ft) :	None	GWL Date:	None
North (m)	East (m)	Drill Date	Ground Level Elevation (ft)	Total Depth (ft)	Type
134121.137	573288.108	08/82	736.23	50	Cable

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Welded Steel	2.1	8 5/8	8	5/16	2.1	50

Borehole Notes:

The logging engineer measured the 8-in. casing and stickup using a steel tape. Measurements were rounded to the nearest 1/16 in. Casing depths are derived from *Hanford Wells* (Chamness and Merz 1993) that also reports grout in the annular space outside the 8-in casing.

Logging Equipment Information:

Logging System:	Gamma 4E		Type:	SGLS (70%) SN: 34TP40587A
Calibration Date:	05/04	Calibration Reference:	DOE-EM/GJ692-2004	
		Logging Procedure:	MAC-HGLP 1.6.5, Rev. 0	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2 Repeat			
Date	02/03/05	02/03/05			
Logging Engineer	Spatz	Spatz			
Start Depth (ft)	48.0	16.0			
Finish Depth (ft)	2.0	10.0			
Count Time (sec)	100	100			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	1.0	1.0			
ft/min	N/A[2]	N/A[3]			
Pre-Verification	DE611CAB	DE611CAB			
Start File	DE611000	DE611047			
Finish File	DE611046	DE611053			
Post-Verification	DE611CAA	DE611CAA			
Depth Return Error	0	0			

Log Run	1	2 Repeat			
(in.)					
Comments	No fine gain adjustment.	No fine gain adjustment.			

Logging Operation Notes:

Logging was conducted with a centralizer on the sonde. Logging data acquisition is referenced to the top of casing. A repeat section was collected in this borehole to evaluate system performance. Before logging, the borehole was swabbed and no contamination was detected.

Analysis Notes:

Analyst:	Henwood	Date:	03/02/05	Reference:	GJO-HGLP 1.6.3, Rev. 0

Pre-run and post-run verifications for the logging system were performed before and after each day's data acquisition. The acceptance criteria were met.

A casing correction for 0.3125-in.-thick casing was applied to the log data.

SGLS spectra were processed in batch mode using APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated with an EXCEL worksheet template identified as G4EJul04.xls using efficiency functions and corrections for casing, water, and dead time as determined from annual calibrations. Dead time corrections are applied to the data when it exceeds 4.7 percent. No correction for water was necessary.

Log Plot Notes:

Separate log plots are provided for the man-made radionuclides (^{137}Cs and ^{60}Co) detected in the borehole, naturally occurring radionuclides (^{40}K, ^{238}U, ^{232}Th [KUT]), a combination of man-made, KUT, and dead time, and total gamma plotted with dead time. For each radionuclide, the energy value of the spectral peak used for quantification is indicated. Unless otherwise noted, all radionuclides are plotted in picocuries per gram (pCi/g). The open circles indicate the minimum detectable level (MDL) for each radionuclide. Error bars on each plot represent error associated with counting statistics only and do not include errors associated with the inverse efficiency function, dead time correction, casing corrections, or water corrections. Repeat log sections for man-made and natural radionuclides are also included. A comparison plot of RLS data acquired in 1999 and the current SGLS data is provided.

Results and Interpretations:

^{137}Cs and ^{60}Co were the man-made radionuclides detected in this borehole. ^{137}Cs was detected throughout the borehole. Concentrations were measured that ranged between approximately 0.2 and 2,300 pCi/g. The maximum concentration was measured at approximately 7 ft.

^{60}Co was detected at a few locations; the maximum concentration was measured at approximately 0.08 pCi/g at 48 ft.

The repeat sections generally indicate good agreement of the man-made and naturally occurring radionuclides.

The comparison plot of RLS and SGLS data show good agreement suggesting no significant changes since 1999. The RLS detected ^{125}Sb (maximum concentration of less than 1 pCi/g) that was not detected by the SGLS in 2005. Almost two half-lives (^{125}Sb half life is 2.7 years) have expired since 1999, and the radionuclide has apparently decayed below the SGLS MDL of approximately 0.5 pCi/g.

References:

Chamness, M.A., and J.K. Merz, 1993. *Hanford Wells*, PNL-8800, Pacific Northwest Laboratory, Richland, Washington.

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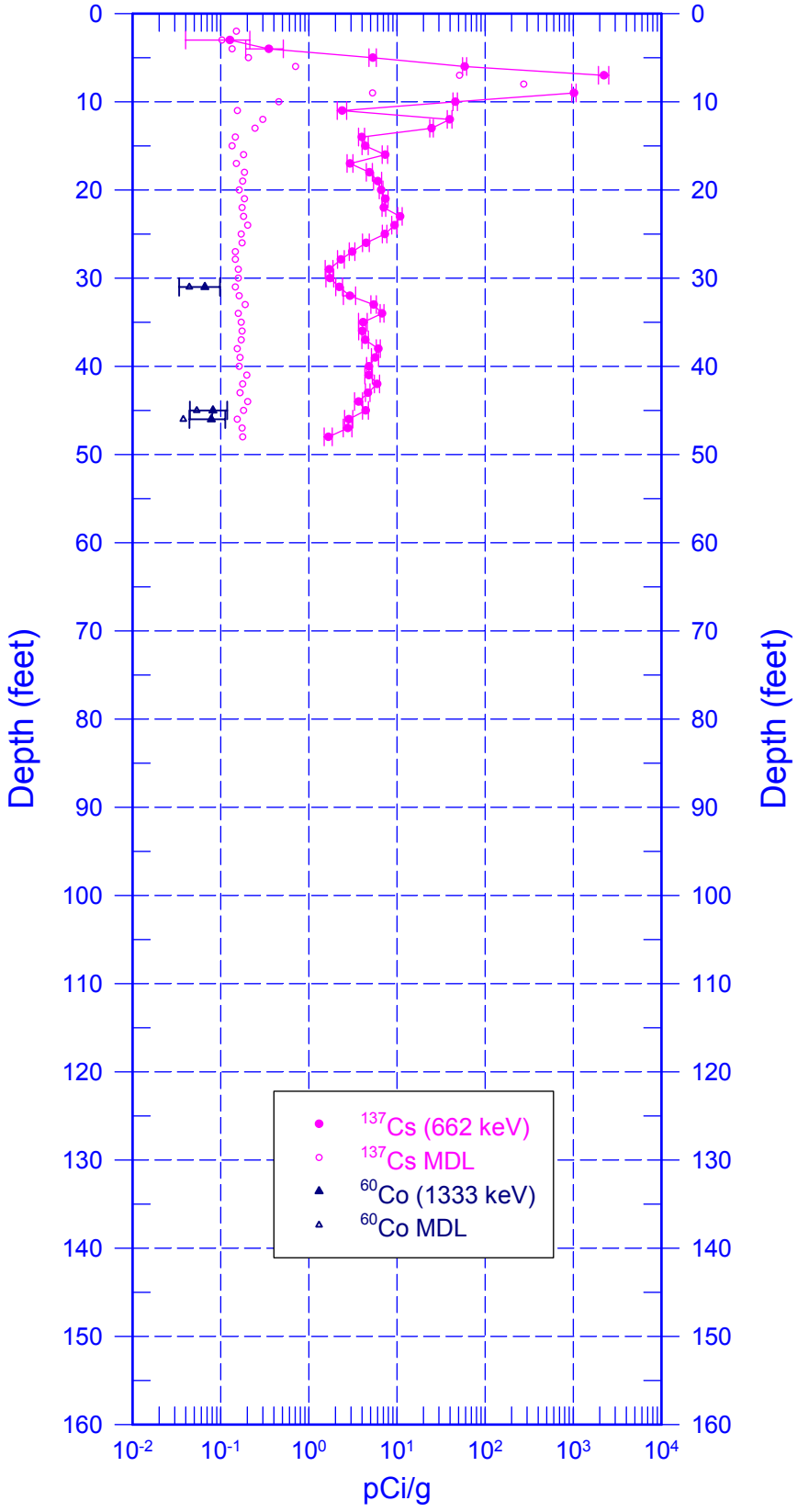
[1] GWL – groundwater level
[2] N/A – not applicable

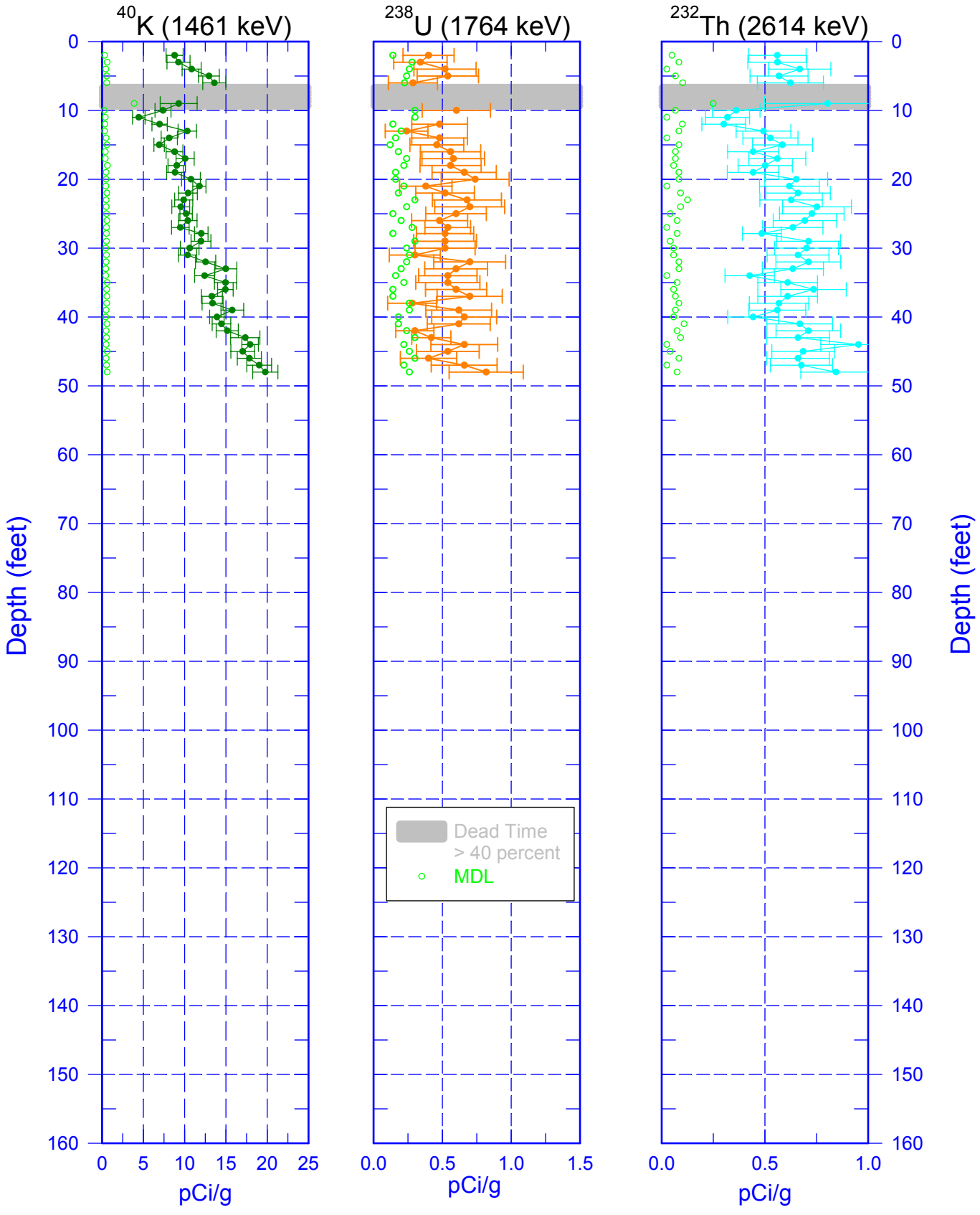
299-E13-57 (A5872)
Man-Made Radionuclides



Zero Reference - Top of Casing

Last Log Date - 02/03/05

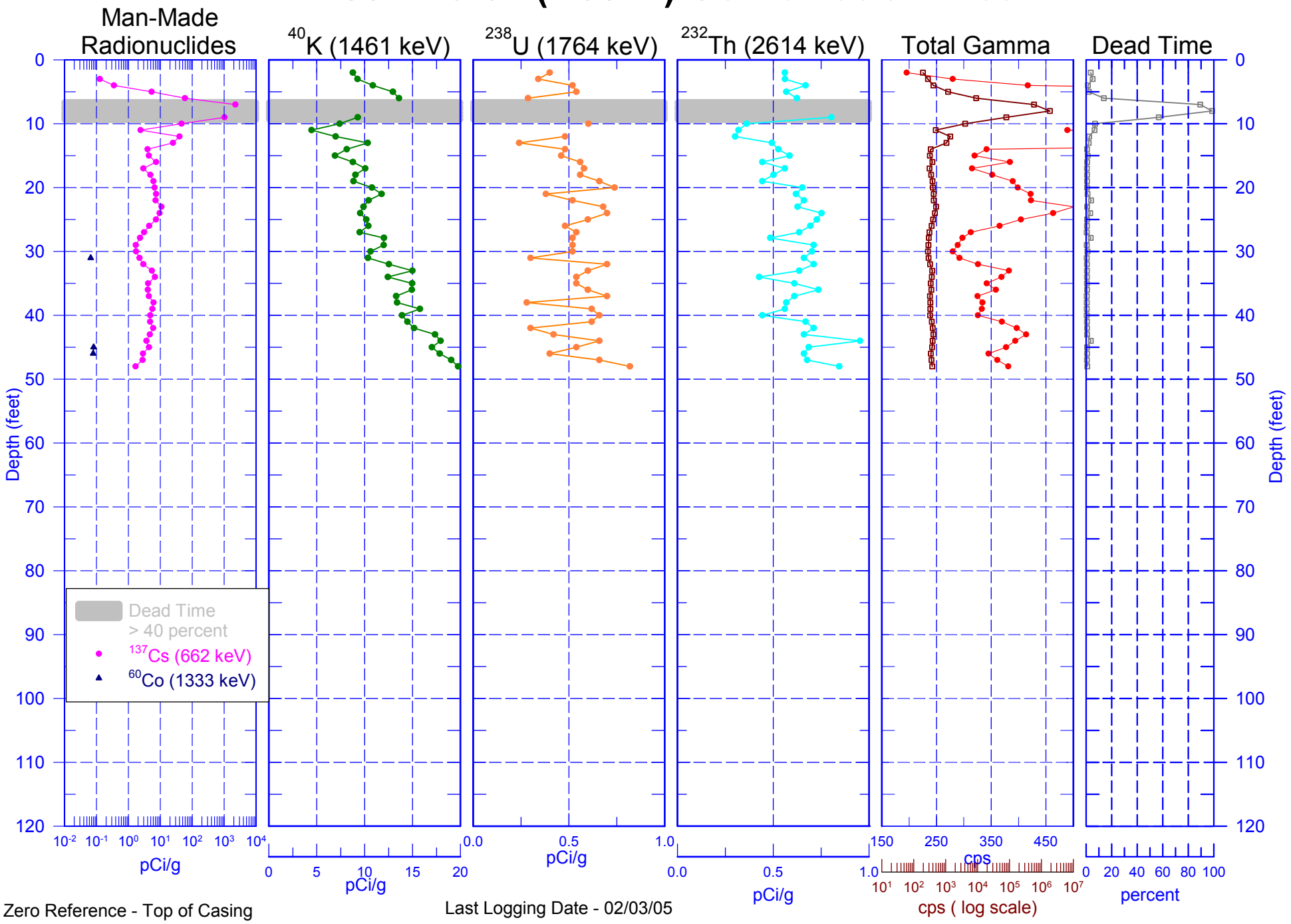
299-E13-57 (A5872)
Natural Gamma Logs



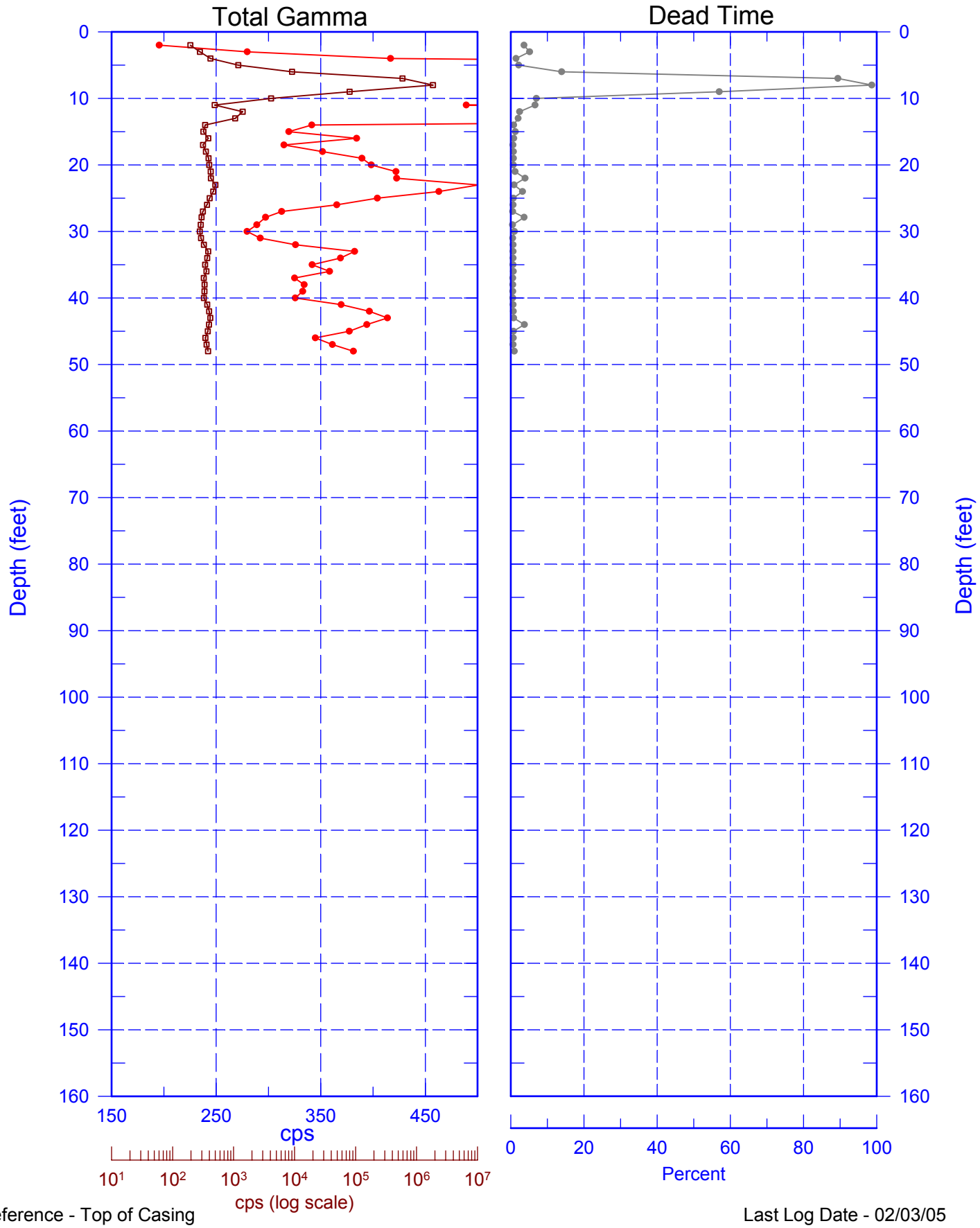
Zero Reference = Top of Casing

Last Log Date - 02/03/05

299-E13-57 (A5872) Combination Plot



299-E13-57 (A5872)
Total Gamma & Dead Time

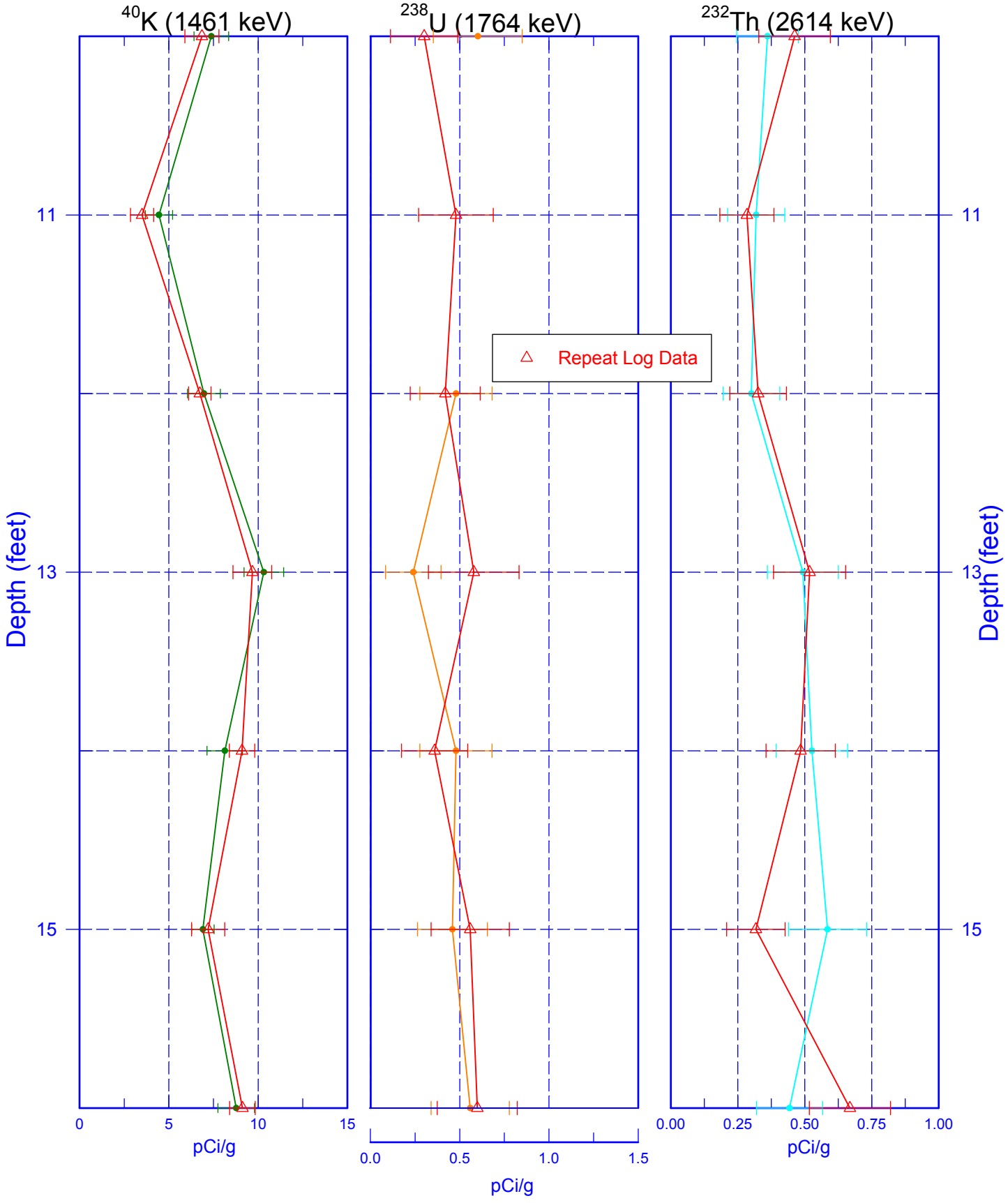


Reference - Top of Casing

Last Log Date - 02/03/05

299-E13-57 (A5872)

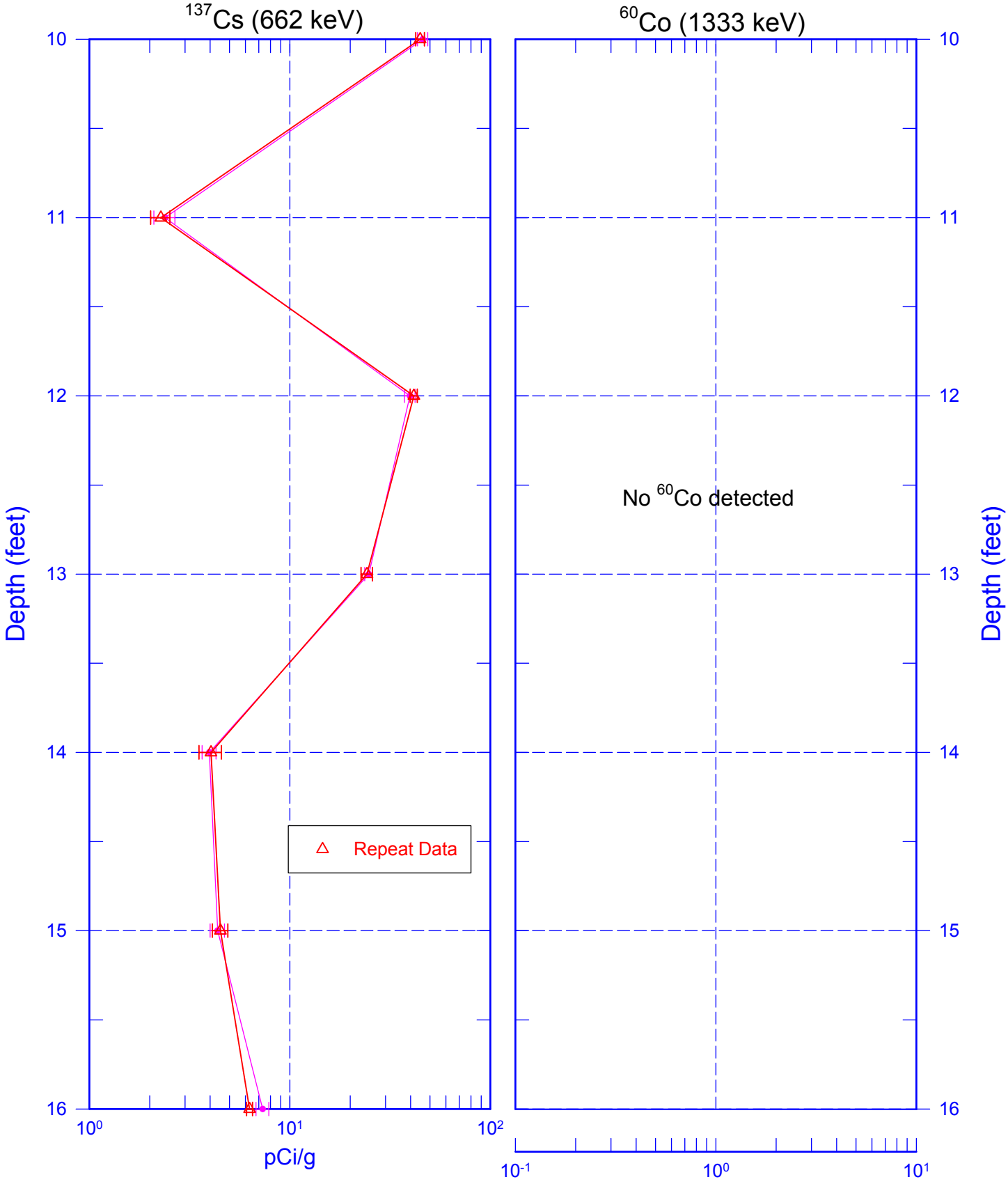
Repeat Section of Natural Gamma Logs



Zero Reference - Top of Casing

Last Log Date - 02/03/05

299-E13-57 (A5872)
Man-Made Repeat (10-16 ft)



Zero Reference - Top of Casing

Last Log Date - 02/03/05

299-E13-57 (A5872)
Man-Made Comparison Logs